PRECONDITIONING

WILL IT PAY THE PRODUCER

AS WELL AS THE FEEDER?

ACPF

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INTRODUCTION

Preconditioning can be defined as a program to minimize the economic losses caused by stress and disease during movement of calves from the cow herd to the feedlot. Most of the practices involved in a preconditioning program are not new, many are standard practices. The first organized preconditioning program started in Iowa in the late 1960's. After a slow initial growth, the program became well established with about 600,000 calves preconditioned in Iowa in 1979. It has been established that over 2 million calves were preconditioned in 11 mid-western states in 1980.

ALBERTA CERTIFIED PRECONDITIONED FEEDER PROGRAM (A.C.P.F.)

The A.C.P.F. program began in 1980 in Ponoka with the sale of 1,203 head. The following year, the current program was accepted by Alberta Agriculture as a pilot project with 5,095 head sold at 7 sales. At that time the Minister of Agriculture established an Advisory Committee to provide guidance to the program. The committee consists of members from Alberta Agriculture, Alberta Veterinary Medical Association, Alberta Cattle Feeders Association, Alberta Auction Association, and representatives of the cow-calf producers.

PROGRAM REQUIREMENTS

The A.C.P.F. Program has two options to accommodate the greatest number of cow calf producers.

Preconditioning Option:

1. Contributor has to have owned the calves for 60 days prior to sale.
2. Weaned 30 days prior to sale.
3. Castrated and dehorned at least 3 weeks prior to sale.
4. Calves must be at least 4 months of age before vaccination.
5. Given 8-way Clostridial vaccine at least 3 weeks prior to sale.
6. Given IBR - PI_3 vaccine under supervision of a licenced veterinarian at least 3 weeks prior to sale.
7. Treated for warble grubs at least 3 weeks prior to sale.
8. Ear tagged with official A.C.P.F. green tag applied under supervision of a licenced veterinarian.
9. Accompanied by an official A.C.P.F. certificate signed by the veterinarian and owner.

Preimmunization Option:

1. All as per above but not weaned.
2. Ear tagged with official A.C.P.F. white tags applied under supervision of a licenced veterinarian.

In order for a preconditioning program to be successful, both the calf producer and the feedlot operator must benefit. The calf producer must be paid for his extra efforts. The feedlot operator must be rewarded with better feedlot performance. There are several advantages and disadvantages to the calf producer and feeder from preconditioning.

	ADVANTAGES	DISADVANTAGES
Cow-Calf Man	1. Increased cow productivity	1. Increased input costs
	2. Increased sale weights	2. Increased labor
	3. Price premium	3. Increased risk
	4. Increased carrying capacity	
Feedlot	1. Improved Health	1. Increased purchase price
	2. Reduced vaccination & warble treatment costs	
	3. Reduced shrink	
	4. Improved production performance	
	5. Reduced risk	

PRECONDITIONING - THE CALF PRODUCER

INTRODUCTION

A calf producers net income depends on calf weights, calf prices and costs. A preconditioning program can effect each of these. Preconditioning will only be economical if the added returns are greater than the added costs. Added returns are a result of increased calf sale weights, increased calf prices, and increased carrying capacity. Added costs are associated with feed, overhead, death losses, disease treatment and vaccination and insecticide costs. A proper evaluation of the economics of preconditioning will consider each of these factors.

ADVANTAGES OF PRECONDITIONING TO THE COW CALF PRODUCER

1. Increased Weaning Weights Per Cow

Cow productivity can be defined as the weight of calf weaned per cow in the breeding herd. It is therefore, dependant on both the average weaning weight of all the calves weaned as well as weaning percent. Weaning percent is the percentage of cows exposed to the bull that wean a calf. Although there are several factors that can influence cow productivity, a preconditioning program may indirectly affect cow productivity through the following:

a) Age of Calf

The age of the calf is an important factor in determining calf weights. This is especially true in calves sold at or near weaning. Obviously the older calf has more time to grow and should, therefore, be heavier. In addition, there is a direct relationship between age and growth rate. Older calves usually have higher rates of gains from birth to weaning.

b. Nutritional Requirements

The calf receives it's entire nutritional requirements for growth from pasture either directly from grazing or indirectly through the dams milk. Therefore, the current seasons pasture condition will have an effect on calf weights.

The past nutritional status of the cow can also effect calf weights and weaning percent. In the late summer and fall, nursing cows faced with declining pasture conditions and increased competition for pasture from calves, may not obtain adequate nutrients to build sufficient body reserves for winter. Body reserves are required to supply additional nutrients when feed is inadequate. In addition, energy stored as body fat acts as an insulation. Cows entering winter in poor shape will require more feed over the winter. The high nutrient requirements of the later stages of pregnancy and early lactation reduce body condition further. Cows in poor condition are difficult to get rebred resulting in more open cows, and younger, smaller calves at weaning the following year. Weaning calves earlier allows the cows to utilize the remaining pasture to rebuild body reserves in preparation for winter.

The effect that increased weaning percent and increased age of calf have on cow productivity is demonstrated in tables 1 and 2. The effect of increased cow productivity on gross return per cow is summarized in table 3. As an example; assuming that calf weaning weights are 450 lb., an increase in weaning percent of 3% results in 13.5 lb. of extra calf weaned per cow. (table 1) Likewise, increasing the age of the calf by 5 days results in 11.25 lbs. of extra calf (table 2). In these examples, cow productivity was increased by 24.75

lbs. at 70¢ calf prices this increased sale weight results in approximately a $17.50 increase in gross returns per cow.

2. Increased Calf Sale Weights

Since traditionally the majority of calves are sold immediately after weaning, the terms weaning weight and sale weight are often used interchangeably. An increasing number of calves are being kept on the farm for varying periods of time before being sold. In these cases the post-weaning management can have considerable influence on the sale weight.

Initially beef calves must rely on their dams for their nutritional needs. Gradually the calf obtains more of it's needs from grazing. By late summer the calf and the cow are often competing directly for a declining amount of poorer quality pasture. During this period, calf growth may not be maximized. Preconditioned calves weaned and fed for optimal gains should gain more than calves left on the cow. Depending upon breed and the feeding program, weaned calves are capable of gains of 1.5 - 2.5 lb/day over a 30 day preconditioning program. The actual differences in gains between weaned and unweaned calves is determined by the particular pasture situation and the weaned-calf feeding program. Alberta observations have shown differences of 0.75 to 1.0 lb. in daily gains.

In addition, sale weight is increased through decreased shrink in the marketing process. Regular healthy calves can shrink 8-10% during marketing. Sick calves may shrink 15%. Shrink on preconditioned calves is usually less, averaging about 6-8%. A significant amount of the extra sale weight of preconditioned calves, is a result of a decreased shrink.

The effect of rate of gain, shrink and calf prices on sale weights and gross returns per calf are illustrated in table 4. The table reveals that a preconditioned calf that has gained at 2 lbs/day for 30 days would weigh 37.8 lbs. more than a regular calf that gained 1.0 lb. while on the cow (479.4 lbs - 441.6 lbs). If calf prices were 70¢ this would represent $26.46/calf ($335.58 - $309.12).

3. Price Premiums for Preconditioned Calves

Although calf prices are set by the market supply and demand relationship, there is a considerable variation between the top and bottom prices in any one year. Within any year calf prices are influenced by calf condition, health, weight, breeding and reputation.

Because preconditioned calves are adapted to the feedlot and have received a vaccination program, their performance and health status should be improved in the feedlot. Feeders recognizing the advantage of preconditioned calves and confident that the program has been carried out properly, are prepared to pay a premium for preconditioned calves. Illustration 1 gives the price premiums paid for A.C.P.F. calves in 1980 and 1981.

Table 4 illustrates the effect that price premium has on gross return per calf. A regular calf gaining at 1.0 lb/day on the cow returns $309.12 at 70¢ calf prices. That same calf preconditioned at 2.0 lb/day returns $364.34 or $28.76 more at a price premium of 6¢/lb. (Table 4)

ILLUSTRATION #1

SUMMARY OF PRICE DIFFERENTIALS

BETWEEN

CERTIFIED (ACPF) AND REGULAR CALVES, 1980-81 (¢/lb)

		Preimmunized		Preconditioned		Number of Sales
		¢/lb	Number of animals	¢/lb	Number of animals	
1980	Steers	+ 4.69	(227)	+ 6.95	(599)	
	Heifers	+ 8.06	(154)	+ 4.65	(223)	1
1981	Steers	+ 2.34	(748)	+ 4.04	(2518)	
	Heifers	+ 0.39	(333)	+ 2.66	(1496)	7
Total	Steers	+ 2.88	(975)	+ 4.60	(3117)	
	Heifers	+ 2.82	(487)	+ 2.92	(1719)	

4. Increased Carry Capacity

Usually early summer forage growth is sufficient to maintain the herd and produce the winter feed required. Many cow calf operators are limited in the number of cows kept by the amount of late summer and fall pasture. In such operations, early weaning reduces the acreage requirement allowing increased carrying capacity of the operation. The cost of pasture associated with the unweaned calf is illustrated in table 5. This table assumes that the fall pasture requirements of the unweaned and weaned calf are the same. By fall most cows are only producing small amounts of milk and the calf is virtually dependant upon pasture for its nutritional requirements. As an example; if the pasture cost per A.U.M. is $10.00 then the cost of having the unweaned calf on pasture is $5/mo. (Table 5)

DISADVANTAGES TO THE COW CALF PRODUCER

1. Increased Costs

Weaning the calf early and feeding it in dry-lot on a grain and stored roughage ration adds to the cost of producing a calf. Some of the other costs involved in preconditioning are yardage, bedding, death losses, treatment costs, and vaccination costs. Costs of preconditioning for various rates of gain are given in Tables 6, 7, 8 and 9. As in example from table 8, if grain and hay prices are $120 and $80 respectively; then the cost of a 30 day preconditioning program at a rate of gain of 2.0 lb/day is $28.00.

2. Increased Labor

As well as increasing input costs, preconditioning increases the labor requirements. Extra labor is required to feed and care for the weaned calf. Some extra labor is required to process the calves for tagging, castrating, dehorning, vaccinating and treating. The largest increase in labor requirement occurs in the fall and may interfere with other farming operations.

3. Increased Risk

Newly weaned calves can be difficult to get on feed and are more subject to health problems. Although there is less risk associated with weaning the calf on the farm of origin rather than in the feedlot, there is still an element of risk. This risk is borne by the calf producer in a preconditioning program.

THE ECONOMICS OF PRECONDITIONING - COW CALF

In the above discussion of the advantages and disadvantages of preconditioning, several added costs and returns were discussed. Tables 1, 2, 4 and 5 illustrate the effect of added returns while tables 6, 7, 8 and 9 illustrate added costs. Illustration 2 summarizes the use of these tables in calculating the effect of preconditioning on the net return to the cow-calf producer.

ILLUSTRATION #2

THE ECONOMICS of PRECONDITIONING - COW-CALF PRODUCER

	Calf Weight (lb)	Returns ($)
Returns		
Increased Weaning Weight*		
- 3% increased weaning % - (Table 1)	13.5	
- 5 day older calf - (Table 2)	11.25	
TOTAL @ 70¢/lb - (Table 3)	24.75	17.32
Increased Sale Weight** - (Table 4)	37.8	26.46
Price Premium - 6.0¢/lb - (Table 4)		28.76
Increased Carrying Capacity**** - (Table 5)		5.00
TOTAL		+ 77.54
Costs		
Feed, vaccine and insecticide*** - (Table 8)		28.00
NET RETURNS		.54

* 450 lb. calf

** regular calf 1.0 lb/day - 8% shrink
preconditioned calf 2.0 lb/day - 6% shrink

*** grain $120/T
hay $ 80/T
2.0 lb/day gain

**** Pasture - $10/AUM

In the above example, the net return to the calf producer is $49.54/calf. A regular calf weighing 450 lbs. would have to receive a premium of 11¢/lb to give the same increase in net income as the above preconditioned calf.

CONCLUSIONS

Although there are increased costs involved in preconditioning, there are also increased returns. Usually the returns are greater than the costs and the net result is a increased net return to the calf producer. Not all the increased returns are a result of a price premium. Price premiums may only represent less than half the added returns. A substantial amount of increased returns is a result of increases in cow productivity and calf sale weights. These returns, while not as visible as the price premium, have also to be considered in any economic evaluation of preconditioning.

PRECONDITIONING - THE FEEDER

INTRODUCTION

An economic evaluation of cattle feeding centers around the following formula:

$$Ps = \frac{(Wp \times Pp) + (C \times Wg)}{Wf}$$

where Ps = breakeven sale price

Pp = purchase price

Wp = purchase weight

Wf = final weight

Wg = weight gain

C = cost of gain

The profitability of feeding cattle depends upon the relationship of the actual price to the breakeven price. Sale prices above the breakeven price result in a profit; prices below a loss. Cattle feeders consider the cost of gain as the most important factor in evaluating the economics of feeding cattle. Cattle feeders evaluating projected, current or past feeding programs are conscious of factors such as feed, interest, yardage, death losses, vaccinations and treatment costs, shrink, etc. A preconditioning program may influence many of these factors. The economic evaluation of feeding a preconditioned calf must consider the effect that preconditioning may have on each of these factors.

ADVANTAGES TO THE FEEDER

1. Improved Health

The practice of moving calves from the cow herd to the feedlot causes stress to the calf. In the presence of disease causing organisms, stress can be a factor in triggering a disease. Some of the stress factors associated with this transfer to the feedlot are:

1. Moving the calf from range to confinement.
2. Weaning
3. Dehorning
4. Castrating
5. Vaccinating
6. Changing the ration to dry feed fed in bunks or self feeders.
7. Changing the source of water to automatic waterers.
8. Long stands and hauls in the marketing process.
9. Mixing calves from different sources.
10. Processing calves into the feedlot.

A preconditioning program doesn't completely remove stress but stress is reduced when the calf is adapted to these changes gradually. In addition, a vaccination program carried out sufficiently in advance of this period, allows the calf to develop an immunity to diseases it will encounter.

A preconditioned calf which has been dehorned, castrated, vaccinated, weaned, accustomed to feed bunks and automatic waterers, should have fewer disease problems. The resulting decrease in deaths and treatments, will lower the cost of production for preconditioned calves. Illustration 3 displays the health performance of A.C.P.F. calves and regular comparison calves. While death losses were about the same, regular calves had a larger number of treatments.

Tables 10 and 11 illustrate the effect of death and disease treatments on the cost of gain. For a difference in death loss of 1% (2% death loss for regular calves and 1% for preconditioned calves) the reduction in cost of gain would be 0.6¢/lb at 75¢ calf prices (Table 10). Likewise a 20% difference in disease treatment rate (30% for regular calves and 10% for preconditioned calves) would reduce the cost of gain by 0.3¢/lb at treatment cost of $10/hd. (Table 11)

2. Reduced Vaccination and Insecticide Costs

Preconditioned and preimmunized calves are vaccinated for a number of diseases and treated for warble grubs before sale. Because these treatments will not have to be repeated by the feeder, the cost of processing preconditioned calves into the feedlot should be lowered by the cost of the vaccines, insecticides and the processing labor. Table 12 illustrates the effect of vaccinating and insecticide costs on the cost of gain. As an example, if vaccination and insecticide costs are $4/hd, then the reduction in cost of gain for a preconditioned calf is 0.7¢/lb gain.

ILLUSTRATION #3

SUMMARY OF HEALTH PERFORMANCE OF
CERTIFIED CALVES 1980 - 1981

Year - Location	Preconditioned # of calves	sick %	dead %	Preimmunized # of calves	sick %	dead %	Comparison # of calves	sick %	dead %
1980 - Alberta	236	7.6	0.0				278	28.3	1.4
				195	17.4	0.5	730	15.0	0.8
- Ontario	213	12.0	0.6	196	26.0	0.0	770	46.0	1.0
TOTAL	449	9.7	0.3	391	21.7	0.3	1778	30.5	1.0
1981 - Alberta	1531	17.9	1.2	190	15.8	1.6	627	26.8	1.0
- Ontario	139	11.5	0.0	104	8.7	0.0	109	20.2	0.9
TOTAL	1670	17.4	1.1	294	13.3	1.0	736	25.8	1.0
Combined Years	2119	15.8	0.9	685	18.1	0.6	2514	29.1	1.0

3. Reduced Shrink

Preconditioned calves on dry feed should shrink less from the market to the feedlot. Because they should regain their sale weight quicker, their cost of production should be less. The effect of shrink on cost of gain is illustrated in table 13. A difference of 1% in shrink (4% for preconditioned calves and 3% for regular calves) represents a 0.6¢/lb reduction in the cost of gain at a calf purchase price of 75¢.

4. Improved Production Performance

Preconditioned calves accustomed to dry feed, automatic waterers and with fewer disease problems, should start on feed quicker and regain their sale weight sooner. In short, preconditioned calves should have increased gains and feed efficiencies especially in the early part of the feeding period. This improved performance should result in lower production costs. Table 14 demonstrates the effect of rate of gain and feed efficiency on the cost of gain in the feedlot. If the cost of the ration over the total feeding period averages $90/T and the preconditioned calves gain 2.10 lb/day, while the regular calves gain 1.95 lb, then the difference in the cost of gain is 3.7¢/lb (51.3 - 47.6). Feed costs are calculated from table 15.

5. Reduced Risk

The largest risk associated with starting regular calves on feed occurs in the first 30 days in the feedlot. This is the period when the calve is adapting to it's new environment and hasn't yet built up an immunity to the new diseases it has encountered. Preconditioned calves already vaccinated and adapted to the feedlot environment should settle into the feedlot with fewer problems. It is difficult to place a dollar

value on the reduced risk associated with preconditioned calves. Each feeder has to evaluate risk from his own standpoint. Risk may not be as important to more established feeders as it is to those with a larger debt.

DISADVANTAGES OF PRECONDITIONED CALVES TO THE FEEDER

INCREASED PURCHASE COST

A.C.P.F. calves have received a premium over regular comparison calves in Alberta. The results for 1980 and 1981 are listed in illustration 1. Price differences for preconditioned calves ranged from a high of 6.95¢ for steers in 1980 to a low of 2.66¢ for heifers in 1981.

ECONOMICS OF THE PRECONDITIONED CALVE IN THE FEEDLOT

Tables 10, 11, 12, 13 and 14 reveal the effects of differences in various production factors on the cost of gain. Table 16 illustrates the effect of differences in cost of gain on the added value of a 450 lb. calf. Table 16 was developed so that a feeder could translate a reduction in cost of gain to an added value for the purchased calf. As an example, a calf that gains 600 lbs. at a reduction in cost of gain of 6¢/lb saves the feeder $36.00. If the total amount saved is applied to the purchase price then the feeder could pay 8¢/lb more for a 450 lb. calf. The use of all of these tables in determining the added value of the preconditoned calve is summarized in illustration 4.

ILLUSTRATION #4:

ECONOMIC EVALUATION OF FEEDING PRECONDITIONED CALVES

Difference between Preconditioned and Regular Calves	Reduction in Cost of Gain (¢/lb)	Added Value*** (¢/lb)
1. Death Loss* (Table 10 - 1% difference)	0.60	
2. Treatment (Table 11 - 20% difference $10 treatment cost)	0.30	
3. Vaccination - Insecticide (Table 12 - $ 4/hd cost)	0.70	
4. Shrink* (Table 13 - 1% difference)	0.60	
5. Production Performance**	3.7	
TOTAL	5.9	8.0(approx)

* Purchase price - 75¢/lb.

** $90/T feed
Regular 1.95/lb/day
Preconditioned 2.10 lb/day

*** 600 lbs. of gain

CONCLUSIONS

Although a complete accounting of all the returns to the calf producer from preconditioning would probably justify preconditioning without a price premium, it is doubtful that many calf producers would bother preconditioning without it. Therefore, preconditioned calves are going to cost the feeder more. This increased cost to the feeder can only be justified by better animal health and increased performance. Although such factors as health performance are more visible, factors such as reduced shrink and reduced vaccination and insecticide costs are important. Probably the most important factor will be increased performance. In the example given, increased performance accounted for over half the decrease in cost of gain. An economic evaluation of feeding preconditioned calves should consider all factors before drawing any conclusions.

Table 1:

THE EFFECT of INCREASING WEANING PERCENT on CALF WEIGHT WEANED PER COW

Average Weaning Weight (lb)*	Increased Weaning %									
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
300	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0
350	3.5	7.0	10.5	14.0	17.5	21.0	24.5	28.0	31.5	35.0
400	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0	40.0
450	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5	45.0
500	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0
550	5.5	11.0	16.5	22.0	27.5	33.0	38.5	44.0	49.5	55.0
600	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0	54.0	60.0
650	6.5	13.0	19.5	26.0	32.5	39.0	45.5	52.0	58.5	65.0
700	7.0	14.0	21.0	28.0	35.0	42.0	49.0	56.0	63.0	70.0

* includes shrink

TABLE 2: THE EFFECT of INCREASING AGE of CALF ON CALF WEIGHT WEANED PER COW

Average Weaning Weight (200 days) (lb)*	Increased Average Age of Calf (days)			
	5	10	15	20
300	7.50	15.0	22.50	30.0
350	8.75	17.5	20.25	35.0
400	10.00	20.0	30.00	40.0
450	11.25	22.5	33.75	45.0
500	12.50	25.0	37.50	50.0
550	13.75	27.5	41.25	55.0
600	15.00	30.0	45.00	60.0

* shrink included

TABLE 3: THE EFFECT of COW PRODUCTIVITY and CALF PRICES on the GROSS RETURNS PER COW ($/hd)

CALF PRICES ($/cwt)	INCREASED COW PRODUCTIVITY (lb. of Calf/Cow)								
	10	15	20	25	30	35	40	45	50
70	7.00	10.50	14.00	17.50	21.00	24.50	28.00	31.50	35.00
72	7.20	10.80	14.40	18.00	21.60	25.20	28.80	32.40	36.00
74	7.40	11.10	14.80	18.50	22.20	25.90	29.60	33.30	37.00
76	7.60	11.40	15.20	19.00	22.80	26.60	30.40	34.20	38.00
78	7.80	11.70	15.60	19.50	23.40	27.30	31.20	35.10	39.00
80	8.00	12.00	16.00	20.00	24.00	28.00	32.00	36.00	40.00
82	8.20	12.30	16.40	20.50	24.60	28.70	32.80	36.90	41.00
84	8.40	12.60	16.80	21.00	25.20	29.40	33.60	37.80	42.00
86	8.60	12.90	17.20	21.50	25.80	30.10	34.40	38.70	43.00
88	8.80	13.20	17.60	22.00	26.40	30.80	35.20	39.60	44.00
90	9.00	13.50	18.00	22.50	27.00	31.50	36.00	40.50	45.00
92	9.20	13.80	18.40	23.00	27.60	32.20	36.80	41.40	46.00
94	9.40	14.10	18.80	23.50	28.20	32.90	37.60	42.30	47.00
96	9.60	14.40	19.20	24.00	28.80	33.60	38.40	43.20	48.00
98	9.80	14.70	19.60	24.50	29.40	34.30	39.20	44.10	49.00
100	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00

TABLE 4: THE EFFECT of RATE of GAIN, SHRINK and CALF PRICES on the GROSS RETURNS PER CALF (450 lb.) of a 30 DAY PRECONDITIONING PERIOD

	REGULAR				PRECONDITION			
A.D.G.	0	.5	1.0	1.5	1.0	1.5	2.0	2.5
Sale Weights 8% shrink	414	427.8	441.6	455.4				
6% shrink					451.2	465.3	479.4	493.5
CALF PRICES (¢/lb)								
70	289.80	299.46	309.12	318.78	315.84	325.71	335.58	345.45
72	298.08	308.02	317.92	327.89	324.86	335.02	345.17	355.32
74	306.36	316.57	326.78	337.00	333.89	344.32	354.76	365.19
76	314.64	325.13	335.62	346.10	342.91	353.63	364.34	375.06
78	322.92	333.68	344.45	355.21	351.94	362.93	373.93	384.93
80	331.20	342.24	353.28	364.32	360.96	372.24	383.52	394.80
82	339.48	350.80	362.11	373.43	369.98	381.55	393.11	404.67
84	347.76	359.35	370.94	382.54	379.01	390.85	402.70	414.54
86	356.04	367.91	379.78	391.64	388.03	400.16	412.28	424.41
88	364.32	376.46	388.61	400.75	397.06	409.46	421.87	434.28
90	372.60	385.02	397.44	409.86	406.08	418.77	431.46	444.15
92	380.88	393.58	406.29	418.97	415.10	428.08	441.05	454.02
94	389.16	402.13	415.10	428.08	424.13	437.38	450.64	463.89
96	397.44	410.69	423.94	437.18	433.15	446.69	460.22	473.76
98	405.72	419.24	432.77	446.29	442.18	455.99	469.81	483.63
100	414.00	427.80	441.60	455.40	451.20	465.30	479.40	493.50

TABLE 5: THE EFFECT of PASTURE COSTS ($/A.U.M.)*
on the COST of MAINTAINING the UNWEANED CALF on PASTURE

$/A.U.M.	$/Calf/MO.
6.00	3.00
8.00	4.00
10.00	5.00
12.00	6.00
14.00	7.00

* Dry Cow - 1.0 A.U.
Weaned Calve - 0.5 A.U.

TABLE 6: THE EFFECT OF FEED* AND VACCINE** COSTS ON THE COST OF PRECONDITIONING A 450 lb. CALF FOR 30 DAYS - 1.0 LB/DAY GAIN ($/HD)

HAY PRICES ($/ton)	GRAIN PRICES ($/ton)								
	80	90	100	110	120	130	140	150	160
50	14.35	14.80	15.25	15.70	16.15	16.60	17.05	17.50	17.95
60	15.70	16.15	16.60	17.05	17.50	17.95	18.40	18.85	19.30
70	17.05	17.50	17.95	18.40	18.85	19.30	19.75	20.20	20.65
80	18.40	18.85	19.30	19.75	20.20	20.65	21.10	21.55	22.00
90	19.75	20.20	20.65	21.10	21.55	22.00	22.45	22.90	23.35
100	21.10	21.55	22.00	22.45	22.90	23.35	23.80	24.25	24.70

* Feed conversion 12.0/1.0, ration 25/75, grain/hay.

** Vaccine, drugs and warble treatment $4.00.

TABLE 7: THE EFFECT of FEED* and VACCINE** COSTS
on the COST of PRECONDITIONING a 450 lb. CALF
for 30 DAYS - 1.5 LB/DAY GAIN ($/hd)

HAY PRICES ($/ton)	GRAIN PRICES ($/ton)								
	80	90	100	110	120	130	140	150	160
50	17.95	18.85	19.75	20.65	21.55	22.45	23.35	24.25	25.15
60	19.30	20.20	21.10	22.00	22.90	23.80	24.70	25.60	26.50
70	20.65	21.55	22.45	23.35	24.25	25.15	26.05	26.95	27.85
80	22.00	22.90	23.80	24.70	25.60	26.50	27.40	28.30	29.20
90	23.35	24.25	25.15	26.05	26.95	27.85	28.75	29.65	30.55
100	24.70	25.60	26.50	27.40	28.30	29.20	30.10	31.00	31.90

* Feed conversion 10.0/1.0, ration 40/60, grain/hay.

** Vaccine, drugs, warble treatment costs $4.00.

TABLE 8: THE EFFECT of FEED* and VACCINE** COSTS on the COST of PRECONDITIONING a 450 lb. CALF for 30 DAYS - 2.0 LB/DAY GAIN ($/hd)

HAY PRICES ($/ton)	GRAIN PRICES ($/ton)								
	80	90	100	110	120	130	140	150	160
50	19.60	20.80	22.00	23.20	24.40	25.60	26.80	28.00	29.20
60	20.80	22.00	23.20	24.40	25.60	26.80	28.00	29.20	30.40
70	22.00	23.20	24.40	25.60	26.80	28.00	29.20	30.40	31.60
80	23.20	24.40	25.60	26.80	28.00	29.20	30.40	31.60	32.80
90	24.40	25.60	26.80	28.00	29.20	30.40	31.60	32.80	34.00
100	25.60	26.80	28.00	29.20	30.40	31.60	32.80	34.00	35.20

* Feed conversion 8.0/1.0, ration 50/50, grain/hay.

** Vaccine, drug and warble treatment cost $4.00.

TABLE 9: THE EFFECT of FEED* and VACCINE** COSTS
on the COST of PRECONDITIONING a 450 LB. CALF
for 30 DAYS - 2.5 LB/DAY GAIN ($/hd)

HAY PRICES ($/ton)	GRAIN PRICES ($/ton)								
	80	90	100	110	120	130	140	150	160
50	19.30	20.65	22.00	23.35	24.70	26.05	27.40	28.75	30.10
60	20.20	21.55	22.90	24.25	25.60	26.95	28.30	29.65	31.00
70	21.10	22.45	23.80	25.15	26.50	27.85	29.20	30.55	31.90
80	22.00	23.35	24.70	26.05	27.40	28.75	30.10	31.45	32.80
90	22.90	24.25	25.60	26.95	28.30	29.65	31.00	32.35	33.70
100	23.80	25.15	26.50	27.85	29.20	30.55	31.90	33.25	34.60

* Feed conversion 6.0/1.0, ration 60/40, grain/hay.

** Vaccine, drug and warble treatment costs $4.00.

TABLE 10: THE EFFECT of DEATH LOSS DIFFERENCES on the COST of GAIN

(¢/lb gain)

Purchase Prices (¢/lb)	% Death Loss Differences				
	1.0	2.0	3.0	4.0	5.0
.60	0.5	0.9	1.4	1.8	2.3
.65	0.5	1.0	1.5	2.0	2.4
.70	0.5	1.1	1.6	2.1	2.6
.75	0.6	1.1	1.7	2.3	2.8
.80	0.6	1.2	1.8	2.4	3.0
.85	0.6	1.3	1.9	2.6	3.2
.90	0.7	1.4	2.0	2.7	3.4
.95	0.7	1.4	2.1	2.9	3.6
1.00	0.8	1.5	2.3	3.0	3.8

TABLE 11: EFFECT of DISEASE TREATMENT RATE DIFFERENCES on the COST of GAIN (¢/lb. gain)

Cost/Treatment ($/hd)	% Treated Differences					
	5	10	15	20	25	30
5.00	0.0	0.1	0.1	0.2	0.2	0.3
7.50	0.1	0.1	0.2	0.3	0.3	0.4
10.00	0.1	0.2	0.3	0.3	0.4	0.5
12.50	0.1	0.2	0.3	0.4	0.5	0.6
15.00	0.1	0.3	0.4	0.5	0.6	0.8

TABLE 12: THE EFFECT of VACCINATION and WARBLE TREATMENT COSTS on the COST of GAIN (¢/lb gain)*

VACCINATION and WARBLE INSECTICIDE COST/HEAD					
2.00	3.00	4.00	5.00	6.00	7.00
0.3	0.5	0.7	0.8	1.0	1.2

* includes product costs as well as labor.

TABLE 13: THE EFFECT SHRINK DIFFERENCES on the COST of GAIN

(¢/lb gain)

Purchase Price (¢/lb)	% Shrink Differences				
	1	2	3	4	5
.60	0.5	0.9	1.4	1.8	2.3
.65	0.5	1.0	1.5	2.0	2.4
.70	0.5	1.1	1.6	2.1	2.6
.75	0.6	1.1	1.7	2.3	2.8
.80	0.6	1.2	1.8	2.4	3.0
.85	0.6	1.3	1.9	2.6	3.2
.90	0.7	1.4	2.0	2.7	3.4
.95	0.7	1.4	2.1	2.9	3.6
1.00	0.8	1.5	2.3	3.0	3.8

TABLE 14: THE EFFECT of RATE of GAIN, FEED CONVERSION and FEED COSTS on the COST of GAIN*

A.D.G. (lb/day)	Feed Conversion (lb/lb gain)	FEED COST ($/T)								
		70	75	80	85	90	95	100	105	110
1.75	10.8	46.4	49.1	51.8	54.5	57.2	59.9	62.6	65.3	68.0
1.80	10.5	45.1	47.7	50.3	53.0	55.6	58.2	60.8	63.4	66.1
1.85	10.2	43.8	46.4	48.9	51.4	54.0	56.6	59.1	61.6	64.2
1.90	10.0	42.9	45.4	47.9	50.4	52.9	55.4	57.9	60.4	62.9
1.95	9.7	41.6	44.1	46.5	48.9	51.3	53.8	56.2	58.6	61.0
2.00	9.5	40.8	43.1	45.5	47.9	50.2	52.6	55.0	57.4	59.8
2.05	9.2	39.5	41.8	44.1	46.4	48.7	51.0	53.3	55.6	57.9
2.10	9.0	38.6	40.9	43.1	45.4	47.6	49.9	52.1	54.4	56.6
2.15	8.8	37.8	40.0	42.2	44.4	46.6	48.8	51.0	53.2	55.4
2.20	8.6	36.9	39.1	41.2	43.4	45.5	47.7	49.8	52.0	54.1
2.25	8.4	36.1	38.2	40.3	42.4	44.5	46.6	48.7	50.8	52.9

* Feed cost and yardage cost per lb. gain

yardage 15¢/hd/day

TABLE 15: FEED PRICES* ($/T) at VARIOUS BARLEY and FORAGE PRICES

Price of Hay ($/T)	Price of Silage** ($/T)	Price of Barley ($/bu) 1.75	2.00	2.25	2.50	2.75	3.00
50	19.44	69.64	74.97	80.30	85.64	90.97	96.30
60	23.33	73.99	79.32	84.66	89.99	95.32	100.65
70	27.22	78.34	83.68	89.01	94.34	99.67	105.01
80	31.11	82.70	88.03	93.36	98.69	104.02	109.36
90	35.00	87.05	92.38	97.71	103.04	108.38	113.71
100	38.89	91.40	96.73	102.06	107.40	112.73	118.06

* Feed prices were calculated on the basis of the following rations:

450 - 750 lbs. growing ration, 1.50 lb/day, 200 days

ration - 4 lb. barley
1 lb. supplement
10 lb. hay

750 - 1050 lb. finishing ration, 2.75/lb/day, 110 days

ration - 20 lb. barley
5 lb. hay
1 lb. supplement

** Silage DM - 35%

TABLE 16:

THE EFFECT of DIFFERENCES in COST of GAIN
on the ADDED VALUE of a 450 lb. CALF (¢/lb)

Difference in Cost of Gain (¢/lb)	Added Value* (¢/lb)
0.5	0.7
1.0	1.3
1.5	2.0
2.0	2.7
2.5	3.3
3.0	4.0
3.5	4.7
4.0	5.3
4.5	6.0
5.0	6.7
5.5	7.3
6.0	8.0
6.5	8.7
7.0	9.3
7.5	10.0
8.0	10.7
8.5	11.3
9.0	12.0
9.5	12.7
10.0	13.3

* 600 lb. of gain.